

## I. INTRODUCTION

This is an update of the attached proposal 93-043. The discussion presented there remains valid and constitutes the bulk of the proposal for jeopardy review.

The goal of the measurement is observation of the small component of the deuteron wavefunction in which the composition of the deuteron is two  $\Delta$  resonances rather than the usual proton and neutron. Although this small component of the deuteron wavefunction has never been directly observed, it has long been assumed in models which fit the electromagnetic form factors of the deuteron. Furthermore, microscopic models of the deuteron's structure consistently predict a significant  $\Delta\Delta$  component. Upper limits on  $P_{\Delta\Delta}$  (the squared-amplitude of the  $\Delta\Delta$  component) from previous attempts at direct observation do not exclude the strengths indicated by interaction models and by the electromagnetic form factors. The deuteron provides a unique laboratory for the study of such virtual excitations because isospin conservation requires that  $\Delta$  excitations occur in pairs, providing a "spectator  $\Delta$ " as a signature of interaction on a pre-existing  $\Delta$ .

## II. HISTORY

The proposal originally requested 25 days of running. Because some of the e1 running could be used for background studies, that request was modified in the PAC presentation to 16 days of dedicated beam contingent upon the  $N^*$  running on deuterium being approved. The experiment was approved for the full 16 days of running requested and the  $N^*$  program was approved. Because of the overlap in target and running conditions both the  $N^*$  program and the present experiment were later grouped by the CLAS Collaboration into the e1 run period for CLAS.

In the three years since CLAS began running, most of the time has been used to provide data to groups of experiments which could run together. Although the present experiment is part of the e1 run period, its simultaneous requirements of reversed field and deuterium